Freescale Semiconductor
Feature Phone Software Application Product Brief

- Fully functional DSP-based telephone with speakerphone and CLASS feature support
- High quality, full duplex speakerphone with performance optimization tools
- Support for on-hook GR-30-CORE services:
  - Calling Number and Name Delivery
  - Dialable Directory Number
  - Visual Message Waiting Indicator
  - Call Qualifier
- Support for off-hook GR-30-CORE services:
  - Calling Identity Delivery on Call Waiting
  - Calling Waiting Deluxe
- Adaptive Line and Acoustic Echo Cancellation
- Multi-line and VoIP conference bridge ready
- Telcordia SR-3004 and SR-TSV-002476 compliant
- Supported by Performance Expert™ (PE)
- An adaptive line echo canceller with a preset tail length of 16ms that is adjustable in 8ms intervals up to 64ms
- An acoustic echo canceller with a preset tail length of 24ms that is adjustable in 8ms intervals up to 64ms
- EIA-470 DTMF dialer
- Extension-in-use detection control
- Tonal Ringing Generator
- Command/Control interface via AT commands or direct function calls

The feature phone application is a fully functional telephone based on the DSP5685x family that provides a highly flexible framework for screenphone and telco service products. This flexibility permits device manufacturers to quickly add a custom user interface and value-added convenience features, such as number and call log directories, voice announce for caller ID, and digital answering/paging functions. The feature phone application can be expanded to support multi-line applications with multi-line conferencing. Feature phone compatibility with telephone networks is worldwide for call origination, call termination and speakerphone operation. Feature phone CLASS features are compatible with GR-30-CORE compliant networks (North America). Figure 1 illustrates the system diagram of the feature phone.

The feature phone application's customizable framework uses four telephony DSP modules. The application software contains the main control loop and a real-time kernel that manages the telephone state and makes calls to dedicated PE modules to perform various functions. The application software performs all start-up initialization and buffer allocation for the telephony modules and hardware drivers and implements communications between device and peripheral drivers and the telephony modules.

The feature phone application communicates with the telephony modules through a well-defined API. All input commands and data samples are passed to the modules through one of three data structures contained within the function calls. These data structures are used by the modules to perform their function and pass telephony events such as Caller ID information back to the application software. A simple serial control interface using AT commands is provided to simplify integration into existing products that contain a host controller.

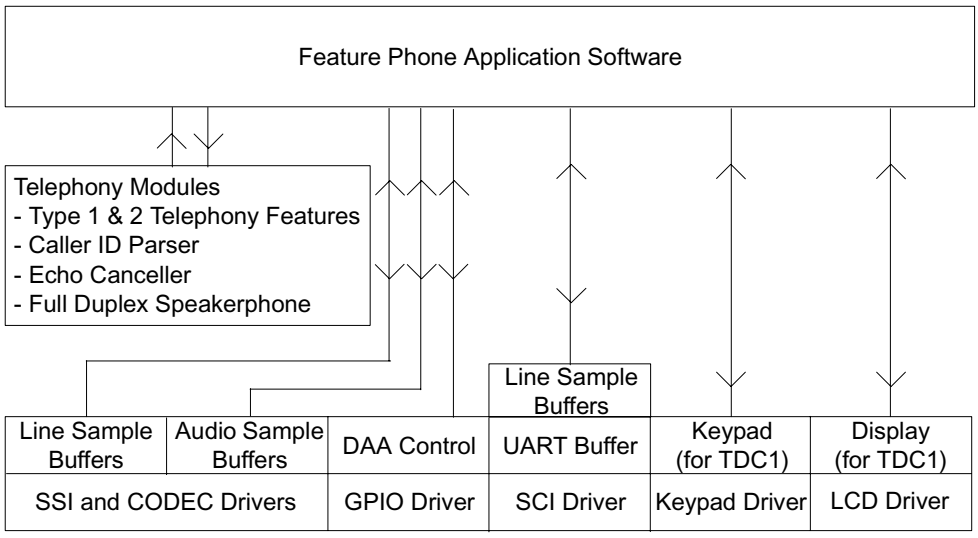

Figure 1-1. Software System Block Diagram

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Table 1-1. Performance

Application	Program (words)	Data (words)	MIPS
Caller ID Type 1-2 software module	2820	257	9.6
Caller ID Parser software module	1440	550	—
Generic Echo Canceller software module (with 8ms tail length)	850	800	12.0
Full Duplex Speaker Phone software module (with 24ms tail length)	1650	930	15.0
Feature Phone application software	1760	1310	1.0

AWARD-WINNING DEVELOPMENT ENVIRONMENT

- Processor Expert (PE) provides a Rapid Application Design (RAD) tool that combines easy-to-use component-based software application creation with an expert knowledge system.
- The CodeWarrior Integrated Development Environment is a sophisticated tool for code navigation, compiling, and debugging. A complete set of evaluation modules (EVMs) and development system cards will support concurrent engineering.
- The Feature Phone Application is supported with the DSP56858EVM and the Telecommunications Daughter Card (TDC1). Together, PE, CodeWarrior and EVMs create a complete, scalable tools solution for easy, fast, and efficient development.

PRODUCT DOCUMENTATION

DSP56800E Reference Manual	Detailed peripheral description of the 56800E architecture, 16-bit core processor and instruction set	Order Number: DSP56F800ERM
DSP56852 User's Manual	Detailed description of the memory, peripherals, and interfaces of the DSP56852	Order number: DSP56852UM
DSP5685x User's Manual	Detailed description of the memory, peripherals, and interfaces of the DSP5685x family of devices	Order number: DSP5685XUM
DSP5685x Evaluation Module User's Manual	Describes in detail the hardware on the DSP56858EVM	Order number: DSP5685XEVMUM
Targeting Freescale DSP5685x Platform	Focuses on specifics of target configuration for Freescale's DSP56852 and DSP56858 devices	Included with Code Warrior
Feature Phone Application	Application documented in Targeting manuals	
Programmer's Guide	Describes the development environment, software modules and tools for DSP568xx devices and the Application Programming Interfaces (APIs)	
GR-30-CORE	*GR-30-CORE, LSSGR: Voiceband Data Transmission Interface Section 6.6 (a module of LSSGR, FR-64)*, Telcordia Technologies, December, 1998.	www.telcordia.com
SR-3004	*SR-3004, Testing Guidelines for Analog Type 1, 2, and 3 CPE as Described in SR-INS-002726 (a module of ADSI, FR-12)*, Telcordia Technologies, January, 1995.	
SR-TSV-002476	*SR-TSV-002476, CPE Compatibility Considerations for the Voiceband Data Transmission Interface*, Telcordia Technologies, December, 1999.	

ORDERING INFORMATION

The Feature Phone Application is included in PE.

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